

FINAL REPORT

BREAKING THE VIRTUAL BARRIER

A Model Program for Preservation Trades Education and Training Utilizing
Satellite and Simulcast Distance Learning Technologies

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Contents

Executive Summary3

Introduction4

Methods and/or Materials5

Results and Discussion.....6

Conclusions7

Acknowledgements7

References.....8

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EXECUTIVE SUMMARY

The Breaking the Virtual Barrier project provided a unique opportunity for Jefferson Community and Technical College to advance the knowledge base in providing instruction in the construction trades. The project provided the opportunity to expand an existing partnership with the Dry Stone Conservancy and pilot unique ways to use emerging technology to provide instruction in the field of preservation trades training. While the original project involved utilizing Interactive Television as the means for broadcasting preservation trades courses, ultimately wireless digital technology was used for implementation. A one week dry stone masonry course was conducted at 2 college sites some 50 miles apart. The course was broadcast in real time to both sites simultaneously. The Master Instructor alternated sites each day so students at each site had the experience of interacting with him since this was a pilot project. The implementation of the project presented its share of technological challenges, but none were impossible to solve. Future projects will benefit from the lessons learned by all parties in the process. In the end, the project was successful in that we were able to use wireless digital technology to transmit real time video and audio to both sites making the instructional experience interactive. It is then possible to take the instructors expertise and broadcast this to students in remote locations.

INTRODUCTION

Jefferson Community and Technical College (JCTC) is a member college of the Kentucky Community and Technical College System (KCTCS) that incorporates xx colleges from across the Commonwealth and provides technical and transfer education to students. Like all other KCTCS institutions, JCTC is an open enrollment public institution; however, Jefferson is the largest KCTCS institution serving over 20,000 students at six campus locations, 3 in Jefferson County-Metropolitan Louisville, and one each in Shelby, Carroll, and Bullitt Counties. KCTCS is the umbrella organization that unites 16 colleges and 67 campuses; KCTCS has a far reaching span across the commonwealth by providing the overall management and organization for Kentucky's system of community and technical colleges. With 67 KCTCS physical locations across the state, and technology embedded to broadcast instruction to students, JCTC through KCTCS was poised to provide the infrastructure for technology that can help break the virtual barrier for education in preservation trades.

Due to other efforts of JCTC in the field of historic preservation, the college was selected to work on a federally funded bridge mitigation project whose intent is provide short term preservation training for individuals. This training would occur at a historic site in the west end of the city of Louisville. The *Breaking the Virtual Barrier* project is laying the groundwork for this and other important programs that are being considered by JCTC and potentially other KCTCS institutions.

Jefferson Community and Technical College began the *Breaking the Virtual Barrier* project in 2005 as an expansion of an existing partnership with the Dry Stone Conservancy. Originally, the *Virtual Barrier* project included the development of a Self Employed Contractor Certificate as well as broadcasting a portion of the Certificate's course content via Interactive Television or ITV, the standard of technology at the time. Work began to bring individuals from JCTC, the Dry Stone Conservancy, Kentucky's Historic Preservation Office, and other parties within KCTCS that had an interest in developing curriculum for historic preservation.

After multiple meetings to discuss curriculum needs and content, a Certificate, along with specific courses were developed and packaged for the KCTCS Program Development. The Certificate was not approved at the meeting held in the fall of 2007 due to some basic questions the committee poised; however, the Certificate is still an option for the college. Additionally, KCTCS provides other options to deliver this curriculum and Certificate; the curriculum may still be pursued at a later date. More research is needed to identify potential students and ensure that course content and the Certificate as a whole will meet the needs of business, industry, and entrepreneurs prior to re-submittal of course and certificate content.

The partner in this project delivering hands-on trades training was the Dry Stone Conservancy, a non-profit organization committed to the preservation of dry stone laid structures and the promotion and revival of the ancient craft of dry stone masonry. After the KCTCS Program Development committee rejected the proposal, the Dry Stone Conservancy was no longer interested in continuing the project and JCTC's contract with them eventually expired. Several discussions took place in the interim as to how to implement this project in a way that was in keeping with the intent of the original proposal. In the fall of 2009, JCTC, the Dry Stone Conservancy, and the NCPTT discussed programmatic changes and options. The end result was a revised scope of work and realigned budget in January 2010.

METHODS AND/OR MATERIALS

Implementation of the new scope of work included a renewed focus on the virtual instruction component of the project. As a result, all efforts were focused on providing an intensive one-week workshop offered by the Dry Stone Conservancy on two KCTCS college campuses. The anchor site was the Shelby County Campus of JCTC, a site where the original partnership with DSC began. The wireless capabilities of the site were expanded, and a remote site was selected some 50 miles away in Lexington, Kentucky at the Leestown Campus of the Bluegrass Community and Technical College, a sister institution to JCTC. Winter 2010 included all of the planning and training required to establish and test the technology, as well as to select the sites for the actual construction of a dry stone wall. DSC staff received basic instruction in Blackboard, the software program used throughout KCTCS for on line instruction. At some point, Blackboard may be used for the delivery of this type of instruction. For the purposes of the March 2010 workshop, the technology was used to deliver the instruction via Live Meeting. While Live Meeting had its limitations with the resolution of the picture produced at each end, it was an appropriate starting point for the delivery of this coursework.

Items used included: high definition digital video production cameras, digital video cameras at each end to provide the live "feed" for instructors and students. High definition television screens to project the video images at each end, LCD projectors to test the display outdoors on a larger scale than the television screens, wireless microphones, lap top computers to run the software, expansion of the wireless router system at one site to boost the wireless signal so it could all take place outdoors.

Daily, the instructors, students, and technology staff assessed what was working well and what needed to be improved. Improvements, which sometimes meant the acquisition of additional equipment or hardware, happened almost daily with sound issues being the most challenging to overcome given the physical locations outdoors as well as weather conditions.

While the workshop was broadcast live at each end all during the week, video of the work was also taken to document the process. A short video was produced to provide a video summary of the project for future reference.

RESULTS AND DISCUSSION

The project participants, technology staff, and instructors held daily debriefings regarding the workshop. Sound quality proved to be the most challenging aspect of the project since both sites were outdoors, and the Leestown campus is located within a large metropolitan community, and the actual site of construction was adjacent to a student parking area. There was a lot of noise from the traffic, and wind that had to be dealt with all during the week. It should be noted that the project took place during the regularly scheduled Spring Break for KCTCS students and the numbers of students in the parking areas and roadways was severely limited. Had the project taken place during the regular semester, the traffic congestion noise would have exacerbated this problem. Multiple attempts were made throughout the workshop to improve the sound quality as it made it difficult for the sites to communicate with each other. Initially communication was accomplished by using cell phones at each site.

Video was not as much of an issue and was consistent through the workshop week. One consideration was the video limitations of the Live Meeting software used. While all of the video displays, cameras, etc. were high definition, the video capabilities of Live Meeting does not support high definition. As a result, the video display of each remote site was graining, lacking the detail that would have aided the instructor with his assessment of the work being performed remotely.

Another consideration for the instructor is the loss of personal contact with students. This feeling was exacerbated by the fact that the instructor had students on hand at his site and a second group of students remotely. While the remote location had an assistant instructor to ensure that students attending had a valuable experience, the master instructor found it challenging to focus attention on the video display of the remote site to offer assistance. At the final assessment meeting with DSC the master instructor indicated that he would be best able to offer assistance and instruction remotely if he was only concentrating on remote instruction and not hands on instruction on site as well as remote locations. Directed attention to the video feed of the remote location would be essential if meaningful instruction is to take place.

The end result of this project was important and will provide valuable information as the college and the Dry Stone Conservancy move forward to expand these types of offerings or provide different types of hands on training. We now know what some of the pitfalls are to offering this type of training remotely and in the future the following issues will need to be addressed:

- Sound quality – wireless digital microphones with headsets were purchased and utilized by mid week. These types of microphones must be used by individuals at both ends in order for real time audio communication to occur. This is essential for instruction and for students to ask questions.
- Digital video feed – explore different video feed software that can accommodate the high definition feeds and display them on LCD units. This high definition quality for the instructor is essential as they are viewing the work completed remotely and for those

receiving instruction to be able to clearly view sample work or the instructors demonstrations of technique.

- Accommodation for incimate weather. While tents were set up remotely, the spring weather was not ideal had the locations been

CONCLUSIONS

It is indeed possible to *Break the Virtual Barrier* with historic preservation trades training. The technology is available and as long as remote sites are planned well in advance, it is reasonable to believe that remote instruction could occur almost anywhere in the world if one can obtain the required equipment and wireless resources. Power and protection of sensitive electronic equipment from the elements is of great concern. More work is needed to discover the best way to address these issues but initially they can almost certainly be dealt with by providing a generator and perhaps tenting the entire work area.

Communication that is clear, reliable, and consistent is essential if instruction is to be delivered remotely. Dealing with the real time communication between students and instructors must occur if the experience is to be of real value to students. They must be able to hear the instructor at all times in order to ask questions, and to hear any information the instructor might have for them individually or as a group. This may mean that each student would require a wireless microphone and it would require basic training in how to use the equipment. Staff will be required to run remote equipment and ensure the connections are running as needed. The biggest advantage of this system seems to be that it provides a way to share the expertise of a master craftsman with more people at remote locations than might otherwise be possible.

Instructors who provide trades training remotely may need to focus only on remote instruction. This focus on the live feed from remote sites would allow the instructor the ability to have a better sense of what is happening remotely and what instruction is required to ensure that students are receiving and understand information correctly and ultimately that they can apply what is learned in concrete ways as they demonstrate their skills remotely.

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REFERENCES

None.